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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,341	12/19/2005	Teruhisa Shibahara	36856.1378	5954

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EXAMINER

TAKAOKA, DEAN O

ART UNIT	PAPER NUMBER
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2817

NOTIFICATION DATE	DELIVERY MODE
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08/05/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/561,341	Applicant(s) SHIBAHARA ET AL.	
	Examiner DEAN O. TAKAOKA	Art Unit 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 13 is/are allowed.
- 6) ☒ Claim(s) 8-11 and 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 May 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/13/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8 – 11, 14, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Takamine et al. (US 6,781,478) for reasons of record contained in the Office action dated March 19, 2009.

Claim 8: Takamine (Fig. 8 et al.) shows an elastic wave filter comprising: two longitudinally coupled resonator type elastic wave filter elements, each longitudinally coupled resonator type elastic wave filter element including three IDTs (both labeled 201-203) arranged on a piezoelectric substrate in a transmitting direction of an elastic wave; wherein two IDTs of one longitudinally coupled resonator type elastic wave filter element are cascade connected to two IDTs of the other longitudinally coupled resonator type elastic wave filter element (201(upper) to 201(lower) and 203(upper) to 203(lower)); and in at least one of the longitudinally coupled resonator type elastic wave filter elements, electrode fingers of one or two of the IDTs that are cascade connected are arranged at a pitch that is smaller than a pitch of electrode fingers of a remaining IDT that is not cascade connected (where the electrode fingers of the center IDT 202 measure approximately 3mm for the central fingers and 4, 5mm for the outer fingers and where the electrode fingers of the outer IDTs 201 and 202 measure approximately

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2mm; thus 202 having a larger pitch than 201 and 202), such that a frequency of a conductance peak in said one or two of the cascade connected IDTs is higher than a frequency of a conductance peak in the remaining IDT (inherent where the structure of electrode pitch is analogous to Applicants inherently comprising the same conductance peak characteristic).

Claim 9: The elastic wave filter according to Claim 8, wherein in each of the longitudinally coupled resonator type elastic wave filter elements, the electrode fingers of said one or two of the IDTs that are cascade connected are arranged at a pitch that is smaller than a pitch of the electrode fingers of the remaining IDT (discussed in the reasons for rejection of claim 1 above).

Claim 10: The elastic wave filter according to Claim 8, wherein a relative dielectric constant of the piezoelectric substrate is about 30 or more (inherent; e.g. LiTaO₃ - col. 4, ln 49 and col. 6, lns 33-39).

Claim 11: The elastic wave filter according to Claim 8, wherein the electrode fingers of the cascade connected IDTs are arranged at a pitch of about $2.108 \mu\text{m}$ (where the term "about" is broad where the IDT wavelength $\lambda_l = 2.03 \mu\text{m}$ corresponding to pitch – col. 5, ln 11).

Claim 14: The elastic wave filter according to Claim 8, wherein a center frequency of a passband of the filter is about 500 MHz or more (Fig. 4 and col. 6, lns 8-10).

Claim 15: The elastic wave filter according to Claim 8, wherein the elastic wave filter is a surface acoustic wave filter, wherein the IDTs are aligned in a transmitting direction of a surface acoustic wave (Fig 8 in view of terminals in Fig. 9).

Claim 17: A communication device comprising the elastic wave filter according to Claim 8 (Fig. 21).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being obvious over Takamine et al. in view of [Funasksa] Funasaka (US 7,245,193) for reasons of record contained in the Office action dated March 19, 2009.

Takamine teaches the elastic wave filter comprising: two longitudinally coupled resonator type elastic wave filter elements wherein the IDTs are aligned in a transmitting direction of an elastic wave between the piezoelectric substrate (discussed in the reasons for rejection of claims above) but is silent where the elastic wave filter is an elastic boundary wave filter, the elastic boundary wave filter further comprising a thin film disposed on the piezoelectric substrate, the thin film having an elastic constant or a density that is different from that of the piezoelectric substrate.

Funasaka teaches an elastic wave device comprising a thin film (8) disposed on the piezoelectric substrate (4), the thin film having an elastic constant or a density that is different from that of the piezoelectric substrate (obvious where the thin film is SiO₂, SiN,

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AIO et al. – col. 6, Ins 39, 40 and the piezoelectric substrate is a different material – col. 5, Ins 32-36 obviously having a different elastic constant or a density).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the elastic wave filter disclosed by Takamine et al. with the boundary thin film disclosed by Funasaka. Such a modification would have been obvious where boundary thin films are well-known in the art and where Funasaka would have realized the advantage of providing protection and improvement for temperature characteristics (col. 6, Ins 52-55) thus suggesting the obviousness of the modification.

Response to Arguments

Applicant's arguments filed May 15, 2009 have been fully considered but they are not persuasive.

Rejections under 35 U.S.C. 102(b) anticipated by Takamine et al.

Applicant's submit "*The Examiner alleged that Fig. 8 of Takamine et al. teaches all of the features recited in Applicant's Claim 8, including the feature of "in at least one of the longitudinally coupled resonator type elastic wave filter elements, electrode fingers of one or two of the IDTs that are cascade connected are arranged at a pitch that is smaller than a pitch of electrode fingers of a remaining IDT that is not cascade connected, such that a frequency of a conductance peak in said one or two of the cascade connected IDTs is higher than a frequency of a conductance peak in the remaining IDT."* Particularly, the Examiner alleged that the electrode fingers in the IDTs

201 and 203 of Takamine et al. are arranged at a pitch that is smaller than the pitch of the electrode fingers of the IDT 202. Applicant's respectfully disagrees.

The Examiner is reminded that when a reference does not disclose that the drawings are to scale, arguments based on measurement of the drawing features are of little value. See Hockerson-Halberstadt, Inc. v. Avia Group Int'l, 222 F.3d 951,956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) (The disclosure gave no indication that the drawings were drawn to scale. "[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.").

Takamine et al. clearly does not disclose or give any indication whatsoever that Fig. 8 or any other figure of Takamine et al. is drawn to scale. In fact, Takamine et al. specifically discloses, in col. 6, lines 55-57, that "FIG. 8 shows a schematic plan view for illustrating the electrode structure of another modified example of the first preferred embodiment of the present invention." Thus, contrary to the Examiner's allegations, Fig. 8 of Takamine et al. certainly cannot be relied upon to allegedly teach or suggest the feature of "in at least one of the longitudinally coupled resonator type elastic wave filter elements, electrode fingers of one or two of the IDTs that are cascade connected are arranged at a pitch that is smaller than a pitch of electrode fingers of a remaining IDT that is not cascade connected, such that a frequency of a conductance peak in said one or two of the cascade connected IDTs is higher than a frequency of a conductance peak in the remaining IDT" as recited in Applicant's Claim 8.

In addition, col. 6, lines 57-62 of Takamine et al. disclose, "In a longitudinally coupled resonator type surface acoustic wave filter 217 shown in FIG. 8, the longitudinally coupled resonator type surface acoustic wave filters 200 according to the first preferred embodiment are longitudinally connected in a two-stage structure."
(emphasis added)

Col. 5, lines 3-11 of Takamine et al. disclose:

The detailed design of an example of the present preferred embodiment of the longitudinally coupled resonator type surface acoustic wave filter 200 will be presented below.

Electrode finger cross width $W=78.8 \lambda l$.

The number of the electrode fingers of each of IDTs 201 and 203=24.

The number of the electrode fingers of IDT 202=40.

IDT wavelength $\lambda l=2.03 \mu m$. (emphasis added)

Therefore, Takamine et al. clearly discloses that the wavelength λl is $2.03 \mu m$ in each of the IDTs 201, 202, and 203 of the longitudinally coupled resonator type surface acoustic wave filter 200, and accordingly, that the pitch, i.e. wavelength/2, of each of the IDTs 201, 202, and 203 shown in Fig.8 is the same. Thus, contrary to the Examiner's allegations, Takamine et al. certainly fails to teach or suggest the feature of "in at least one of the longitudinally coupled resonator type elastic wave filter elements, electrode fingers of one or two of the IDTs that are cascade connected are arranged at a pitch that is smaller than a pitch of electrode fingers of a remaining IDT that is not cascade

connected, such that a frequency of a conductance peak in said one or two of the cascade connected IDTs is higher than a frequency of a conductance peak in the remaining IDT" as recited in Applicant's Claim 8. " which the Examiner disagrees.

While reference is "silent" with respect to the "precise proportions of the elements", there is no teaching that the drawings and in particular Fig. 8 is not representative to support the rejections of record above. Clearly, Fig. 8 shows electrode fingers of the IDTs 201 and 202 having a different pitch and further supported by (col. 5, lines 27-30) where Takamine teaches the pitch of at least electrode fingers 206 and 207 (of IDT 202 – Fig. 1) are different than the rest of the electrode fingers supporting what is shown in the figures.

Applicant cites col. 5, lines 3-11 of Takamine. The Examiner directs Applicant's attention to col. 5, lines 27-30 which further teaches "In addition to Fig. 1, **the widths of the electrode fingers 206 and 207 on each side of the IDT 202 are preferably broader than those of the remaining electrode fingers.**" (emphasis added). Thus as can be seen by the explicit teaching of Takamine, the pitch of at least electrode fingers 206 and 207 are different than the rest of the electrode fingers supporting what is shown in the figures (discussed above). Moreover, fingers 206 and 207 are of IDT 202 which is not cascade connected (Fig. 8) thus Applicant's arguments are not persuasive and the rejections of record above are maintained by the Examiner.

Rejections under 35 U.S.C. 103(a) as being obvious over Takamine et al. in view of Funasaka

The Examiner notes the spelling of the inventor listed in the prior art [Funasksa] Funasaka has been corrected by the Examiner. No other changes have been made to the rejections of record above.

Applicant's submit "*The Examiner relied upon Funasaka to allegedly cure deficiencies of Takamine et al. However, Funasaka clearly fails to teach or suggest the feature of "in at least one of the longitudinally coupled resonator type elastic wave filter elements, electrode fingers of one or two of the IDTs that are cascade connected are arranged at a pitch that is smaller than a pitch of electrode fingers of a remaining IDT that is not cascade connected" as recited in Applicant's Claim 8. Thus, Funasaka fails to cure the deficiencies of Takamine et al. described above.*" Which the Examiner disagrees.

It is the position of the Examiner that Funasaka teaches a single longitudinal resonator (Fig. 5) analogous to the single longitudinal resonator of Takamine (Figs. 1-3) where Takamine shows additional embodiments of cascade coupled longitudinal resonators (Fig. 8 et al.). While Funasaka does not show two IDTs cascade connected, this is shown by Takamine where the prior art of Funasaka is introduced to show the obviousness of modifying Takamine with a thin film having an elastic constant or a density that is different from that of the piezoelectric substrate such as shown and taught by Funasaka. Moreover, the advantage of combining Funasaka is given in the rejection of record above thus suggesting the obviousness of the modification.

It is the position of the Examiner that the combination would have been obvious thus Applicant's arguments are not persuasive and the rejections of record above are maintained by the Examiner.

Allowable Subject Matter

Claims 12 and 13 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach or suggest the limitations of the claims. Takamine shows an elastic wave filter comprising: two longitudinally coupled resonator type elastic wave filter elements but neither Takamine nor Funasaka teaches or suggests four of the electrode fingers of the cascade connected IDTs adjacent to the remaining IDT are arranged at a pitch of about $1.941\text{ }\mu\text{m}$ (claim 12) or the pitches of the electrode fingers in the cascade connected IDTs are smaller than the pitches of the electrode fingers in the remaining IDT by a ratio within a range of about 0.995 to about 0.850 (claim 13) nor would it have been obvious to combine the prior art of record thus the claims are allowable.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEAN O. TAKAOKA whose telephone number is (571)272-1772. The examiner can normally be reached on 9:00a - 5:30p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Dean O Takaoka/
Primary Examiner, Art Unit 2817